REMARKS

The owner of the present patent application has appointed the undersigned as its representative on the present patent application. Accordingly, the undersigned is filing the present response by acting in a representative capacity. *See* 37 C.F.R. 1.34. A formal power of attorney will be submitted later.

Applicants have received the Office Action mailed October 27, 2009. Applicants have canceled claims 1-16 without disclaimer or prejudice, and added new claims 17-38. As such, claims 17-38 are pending, of which claims 17 and 28 are independent. Applicants request consideration of the pending claims in view of the following remarks.

New independent claim 17 and its dependent claims are directed to methods for determining imaging characteristics of an object. New independent claim 28 and its dependent claims are directed to a system. The new claims are supported by the original disclosure, for example as indicated in the table below.

New claim	**Example from specification**
17. A method for determining imaging characteristics of an object, the method comprising:	The set-up in FIG. 1 determines and represents characteristics of an object 3. (Spec. page 5, lines 14-23.)
casting incident light in a linear shape from one light source onto a specific location on an object;	In FIG. 1, the linear light source 2 casts a line 4 on the object 3. (5:14-23.)
capturing detected light with one image sensor while casting the incident light, the detected light including at least (i) light from reflection of the incident light, and (ii) light from scattering of the incident light;	The set-up in FIG. 1 includes a camera 1. (5:14-16.) The light registered by the camera 1 includes reflected light and light scattered in the object. (5:25-26.)
generating a record associated with the specific location from the detected light, the record including at least (i) first information about the reflection of the incident light, and (ii) second information about the scattering of the incident light; and	Figure 2 shows the image 5 registered by the camera 1. (5:18-19.) Line 6 in the image 5 is a representation of the laser line 4. (5:18-19.) FIGS. 5 and 6 show an intensity distribution 13 which corresponds to light scattered in the object. (7:14-27.)
determining an object profile for the specific location and an object scattering property for the specific location by reading the first and second information in the record associated with the specific location.	The image 5 is used to determine an object profile (5:25—7:13) and an object scattering property (7:14-27.)

New claim	Example from specification
18. The method of claim 17, wherein generating the record comprises forming a first image from the captured light.	Figure 2 shows the image 5 registered by the camera 1. (5:18-19.)
19. The method of claim 17, wherein: the light source is a laser forming a line of laser light on the object; the first image contains a profile corresponding to the line of laser light on the object; the object profile is determined using the profile in the first image; and the object scattering property is determined using an intensity distribution of the profile in the first image.	In FIG. 1, the In FIG. 1, the linear light source 2 can be a laser. (5:14-16.) Line 6 in the image 5 is a representation of the laser line 4. (5:18-19.) The image 5 is used to determine the object profile. (5:25—7:13.) The image 5 is used to determine the object scattering property. (7:14-27.)
20. The method of claim 19, wherein determining the object scattering property comprises: identifying a middle area and an edge area in the intensity distribution; and comparing an intensity in the edge area with at least an intensity in the middle area.	A measure of the light scatter can thereby be obtained, for example, by directly studying the intensity in the edge 20 areas (A in Figure 6), or alternatively by comparing the outer areas with the middle area (6 in Figure 6), or the total intensity (A+6)
21. The method of claim 18, wherein generating the record further comprises processing the first image to generate a second image having a reduced data quantity compared to the first image.	A total image 7 can be generated from the image (5:20-23) and this total image has a reduced data quantity (5:6-12).
22. The method of claim 21, wherein the first image includes image information distributed in rows and columns that represents at least part of the linear shape, and wherein the method further comprises: (i) successively selecting respective subsets of the rows; (ii) for each row in each of the subsets, determining whether the row's portion of the image information meets a criterion, and if so registering in the record any of the columns where the criterion is exceeded; and (iii) generating a representative row for each of the subsets using the image information of the rows in the respective subset, the second image formed by the representative rows and containing a version of the linear shape of the incident light.	The image information is distributed in columns and rows. (5:20-21.) Rows {1, 11, 21}, etc., are selected. (5:21-23.) In the summation, it is detected when the cumulative total passes a threshold value. (5:28—6:3.) In the image 7, row 1 represents the rows {1, 11, 21}, etc. (5:21-23.)
23. The method of claim 22, wherein generating each representative row comprises: processing the portion of the image	In the summation, it is detected when the cumulative total passes a threshold value. (5:28—6:3.)

New claim	Example from specification
information of each row in the subset; and detecting, while processing, whether a sum of added image information for any of the columns exceeds the criterion.	
23. The method of claim 23, wherein the processing comprises summing the portion of the image information of each row in the subset.	The detection whether the cumulative total passes a threshold value can be done during a summation. (5:28—6:3.)
25. The method of claim 23, wherein the processing comprises performing a max operation on the portion of the image information of each row in the subset.	The detection whether the cumulative total passes a threshold value can be done while performing a max operation. (5:28—6:3.)
26. The method of claim 17, wherein the object is elongate in one direction essentially perpendicular to the linear shape of the incident light.	In FIG. 1, the object 3 is elongate in a direction that is essentially perpendicular to the linear shape of the line 4. (5:14-23)
27. The method of claim 17, wherein at least one of the light source and the object is moving while the incident light is cast and the detected light is captured.	In FIG. 1, at least one of the linear light source 2 and the object 3 can be moving. (1:12-17.)
28. A system comprising:	FIGS. 1, 7 and 8 show examples of systems; *see, e.g.,* measurement system mentioned in original claim 1.
one light source casting incident light in a linear shape onto a specific location on an object;	In FIG. 1, the linear light source 2 casts a line 4 on the object 3. (5:14-23.)
one image sensor capturing detected light while the incident light is being cast, the detected light including at least (i) light from reflection of the incident light, and (ii) light from scattering of the incident light;	The set-up in FIG. 1 includes a camera 1. (5:14-16.) The light registered by the camera 1 includes reflected light and light scattered in the object. (5:25-26.)
an image-processing unit generating a record associated with the specific location from the detected light, the record including at least (i) first information about the reflection of the incident light, and (ii) second information about the scattering of the incident light; and	Figure 2 shows the image 5 registered by the camera 1. (5:18-19.) Line 6 in the image 5 is a representation of the laser line 4. (5:18-19.) FIGS. 5 and 6 show an intensity distribution 13 which corresponds to light scattered in the object. (7:14-27.)
wherein the image-processing unit determines an object profile for the specific location and an object scattering property for the specific location by reading the first and second information in the record associated with the specific location.	The image 5 is used to determine an object profile (5:25—7:13) and an object scattering property (7:14-27.)
29-38.	*See* above re dependent claims 18-27, respectively.

Rejection under section 103

Claims 1, 8-9, 13-14 and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Luminari (U.S. 4.984,172) in view of Varghese et al (CA 2 335 784) and Ervin (U.S. 4,168,489). Claims 3-6 and 11-12 are rejected under 35 U.S.C. 1 03(a) as being unpatentable over Luminari and Ervin in view of Kableshkov (U.S. 5,490,100).

These rejections are rendered moot by the above cancellations, but Applicants are not conceding that the rejections have merit. Rather, Applicants are submitting new claims 17-38 to better define a feature that distinguishes the present subject matter from the references of record: the ability to obtain profile information and scatter characteristics for the same location of an object from a single record. Applicants will comment on how the independent claims 17 and 28 differ from the cited references.

Luminari describes a system for detecting defects such as splits and knot-holes in articles. *See* Luminari abstract. Luminari projects a laser beam onto a wood panel 12 (FIG. 6) and then detects whether the reflected light shows any variation in light intensity (which can indicate a dark knot or other spot on the panel) or any variation in Z coordinate (which can indicate a split or a hole). *See* Luminari 2:67—4:8. Luminari does not determine scatter properties and does not obtain scatter properties from any record.

Varghese describes a wood-differentiating system that differentiates between fir and spruce lumber based on how fibers of the wood scatter light. *See* Varghese abstract. Varghese's FIG. 1 shows that light from a laser 18 is detected by a camera 20. Varghese does not determine a profile of the lumber and does not obtain any profile information from any record.

Ervin describes a system that reduces a full page of text to fit on the screen of a particular word processor. *See* Ervin abstract. Ervin was cited as allegedly disclosing some features of the now-cancelled claims regarding rows and columns. Applicants respectfully disagree with the suggestion that Ervin processes rows and columns as is described in the present patent application, and Applicant here merely points out that Ervin does not obtain, and was not alleged to obtain, profile information and scatter characteristics for the same location of an object from one record, such as an image.

The new claims are patentable over the references because the present subject matter obtains profile information and scatter characteristics for the same location of an object from a single record. The claims bear out this notion in multiple ways. First, independent claims 17

and 28 recite that the light is cast from "one light source" and that the detected light is captured with "one image sensor." Second, the present claims recite that a record is generated that includes at least two types of information: "information about the *reflection* of the incident light" and information "about the *scattering* of the incident light" (emphasis added). That is, the same record includes both reflection information and scattering information, and these are then read from the record to determine an object profile and a scattering property for the object. That is, the record is used to determine both the object profile and the scattering property for the same location of the object (i.e., the location on which the incident light was cast.)

None of the cited references suggests determining profile information and scatter characteristics for the same location of an object using a single record. Nor would the proposed combination of the references achieve such a result. No reason exists other than hindsight from the present disclosure why a person of ordinary skill in the art would modify the references so fundamentally and significantly. As such, the references do not render the present independent claims and their dependent claims unpatentable.

Conclusion

The new claims 17-38 are patentable over the references of record.

Please charge deposit account 06-1050 in the amount of $104.00 for excess claims fee, $130 for extension of time fee, and $810 for the request for continued examination (RCE) fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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